

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Number : 10/724,361 Confirmation No.: 8077
Applicant : Delphine DUCLOS et al.
Filed : December 1, 2003
Title : PROCESS FOR THE CATALYTIC DECOMPOSITION OF N₂O
TO N₂ AND O₂ CARRIED OUT AT HIGH TEMPERATURE
TC/Art Unit : 1754
Examiner: : Wayne A. LANGEL

Docket No. : 58779.000037
Customer No. : **21967**

MAIL STOP AMENDMENT

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

REQUEST FOR EXTENSION OF TIME AND
RESPONSIVE AMENDMENT UNDER 37 C.F.R. § 1.111

Sir:

REQUEST FOR EXTENSION OF TIME

Applicant respectfully requests a one-month extension of time under 37 C.F.R. § 1.136(a) for responding to the Office Action mailed on September 7, 2005 in the above-captioned patent application. Accordingly, it is respectfully requested that the time for response be extended up to and including January 9, 2006. The Commissioner is hereby authorized to charge the undersigned's **Deposit Account 50-0206** the \$120.00 to cover the one-month extension of time fee. In the event of any variance between the amount enclosed and the fees determined by the U.S. Patent and Trademark Office for reconsideration of this application, please charge or credit any such variance to the undersigned's Deposit Account No. 50-0206.

AMENDMENT

Responsive to the Office Action mailed September 7, 2005, the period for response to which having been extended up to and including January 9, 2006, please amend the above-captioned application as set forth below.

Amendments to the Claims are reflected in the listing of claims which begins on page 3 of this paper.

Remarks/Arguments begin on page 5 of this paper.

AMENDMENT OF THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A process for the decomposition of N_2O to N_2 and O_2 comprising: decomposing N_2O to N_2 and O_2 carried out at a temperature of between 700 and 1 000°C and at a high-HSV of more than about 50,000 h^{-1} ~~characterized in that it is carried out in the presence of a catalyst that comprises~~ composed of a mixed oxide of zirconium and of cerium predominantly existing in the form of a solid solution.
2. (currently amended): The process as claimed in claim 1, ~~characterized in that wherein~~ the catalyst exhibits an effective specific surface of greater than 25 m^2/g .
3. (currently amended): The process as claimed in claim 1, ~~characterized in that wherein~~ the $\text{ZrO}_2/\text{CeO}_2$ ratio by weight in the catalyst is between 80/20 and 20/80 ~~and preferably between 70/30 and 30/70~~.
4. (currently amended): The process as claimed in ~~one of claims 1 to 3, characterized in that wherein~~ the catalyst also comprises yttrium.
5. (currently amended): The process as claimed in one of claims 1 to 4, ~~characterized in that wherein~~ the catalyst has a specific surface of ~~the fresh catalyst is between 60 and 150 m^2/g when fresh~~.
6. (currently amended): A process for the decomposition to N_2 and O_2 of N_2O present in the effluent from a unit for the production of nitric acid, ~~characterized in that comprising:~~ decomposing N_2O to N_2 and O_2 with a catalyst that comprises ~~composed of~~ a mixed oxide of zirconium and of cerium in the form of a solid solution is positioned under ~~the~~ at least one platinum gauzes of the reactor for the oxidation of ammonia, wherein the decomposition is carried out at a temperature of between 700°C and 1000°C and at a HSV of more than about 50,000 h^{-1} .

7. (new): The process as claimed in claim 1, wherein the $\text{ZrO}_2/\text{CeO}_2$ ratio by weight in the catalyst is between ~~70/30 and 30/70~~.

REMARKS/ARGUMENTS

These Remarks are responsive to the Office Action mailed September 7, 2005 ("Office Action"). Claims 1-7 are pending in the application. Claims 1- 6 are amended. Claim 7 is new. Support for the amended and newly claimed subject matter may be found, for instance, in the claims and specification as originally filed. In particular, support may be found at page 3 of the specification and by reference to the figures. The term "comprises" is used instead of "composed of" in claims 1 and 6 to be consistent with dependent claim 4 which uses the term "comprises." Applicant respectfully requests reconsideration of the rejection of the pending claims for the following reasons.

35 U.S.C. § 112, 2d para.

The Office Action rejects claims 1-6 under 35 U.S.C. § 112, second paragraph, as being indefinite. The term "high HSV" has been replaced by "HSV of more than 50,000 h⁻¹." The term preferably has been removed from the claims. Claim 5 has been amended to remove the alleged lack of antecedent basis in the claim. Claim 6 has been amended to remove the alleged lack of antecedent basis and the alleged lack of positive limitations. Accordingly, the rejection of claims 1-6 under 35 U.S.C. § 112, second paragraph, as being indefinite must be withdrawn.

Claims 4-5 are rejected as being improper multiple dependent claims. Claim 4 has been amended to make it non-multiple dependent. Claim 5 is no longer dependent on a multiple dependent claim. Accordingly, the rejection of claims 4-5 as being improper multiple dependent claims must be withdrawn.

Anticipation -- 35 U.S.C. § 102

The Office Action rejects claim 1 under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 5,690,900 ("Smojver").

Anticipation requires that every claim limitation be taught in a single prior art reference. Claim 1 requires, among other limitations, "decomposing N₂O to N₂ and O₂." Smojver discloses a process of oxidation of ammonia in the presence of an oxidation catalyst comprising alumina,

zirconium salt (preferably zirconium oxide) and cerium salt (preferably cerium nitrate). Smojver, col. 2, ll. 63-66. The Office Action states that N_2O would inherently form in the process of Smojver. "In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." M.P.E.P. § 2112 (quoting Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original)). "The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic." Id. Claim 1 requires decomposition of N_2O rather than formation of N_2O . Even if N_2O is formed on the catalyst of Smojver as asserted in the Office Action, it is not clear how that same catalyst could also decompose the N_2O . The Office Action fails to point to any steps of Smojver which are conducted for the purpose of decomposition. The Office Action thus fails to show that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. Thus, the Office Action fails to establish that Smojver teaches decomposing N_2O to N_2 and O_2 . Accordingly, the rejection of claim 1 as anticipated by Smojver must be withdrawn.

Claim 1 also requires "a catalyst comprising a mixed oxide of zirconium and of cerium predominantly existing in the form of a solid solution." Smojver discloses a catalyst for oxidizing ammonia of zirconium oxide and of cerium nitrate. Smojver, col. 2, ll. 63-66. The Office Action fails to establish that Smojver teaches a mixed oxide of zirconium and of cerium. Accordingly, the rejection of claim 1 as anticipated by Smojver must be withdrawn.

Claim 1 also requires a HSV of more than $50,000\text{ h}^{-1}$. Smojver does not disclose the HSV conditions now claimed. As discussed in the specification as originally filed the known usual value of HSV is about $30,000\text{ h}^{-1}$. Specification, page 3, first paragraph. Accordingly, the rejection of claim 1 as anticipated by Smojver must be withdrawn.

Obviousness -- 35 U.S.C. § 103

The Office Action rejects claims 1, 2, 3, and 5 under 35 U.S.C. § 103 as being obvious over Smojver.

"To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." M.P.E.P. § 2143.03. As discussed above, Smojver fails to teach or suggest numerous aspects of the claimed invention. In particular, Smojver fails to teach or suggest "decomposing N_2O to N_2 and O_2 ", "a catalyst comprising a mixed oxide of zirconium and of cerium predominantly existing in the form of a solid solution", or "a HSV of more than $50,000 \text{ h}^{-1}$." Absent any teaching or suggestion to practice the above claim limitations in the cited reference, claim 1 is not obvious in view of Smojver. Claims 2-5 and 7 depend from and incorporate the limitations of claim 1. Accordingly, the rejection of claims 1-5 and 7 under 35 U.S.C. § 103 as obvious over Smojver must be withdrawn.

The Office Action rejects claims 6 under 35 U.S.C. § 103 as being obvious over Smojver in view of U.S. Patent No. 5,478,549 ("Koch").

As discussed above, Smojver teaches oxidizing ammonia and fails to teach or suggest "decomposing N_2O to N_2 and O_2 ", "a catalyst comprising a mixed oxide of zirconium and of cerium in the form of a solid solution", "a HSV of more than $50,000 \text{ h}^{-1}$ ", or "a solid solution is positioned under at least one platinum gauze of the reactor for the oxidation of ammonia."

Koch teaches a process for production of nitric oxide, whereby after formation of nitric oxide and nitrous oxide using a platinum catalyst "nitrous oxide is converted to nitrogen and oxygen by passing it through a bed of zirconium oxide at reaction temperature." Koch, Abstract. Koch further teaches a bed volume of 30,000 bed volumes per hour. Koch, col. 3, first paragraph. Koch fails to teach or suggest "a catalyst comprising a mixed oxide of zirconium and of cerium in the form of a solid solution", or "a HSV of more than $50,000 \text{ h}^{-1}$."

The process of the present invention can be carried out at a higher HSV (more than about $50,000 \text{ h}^{-1}$) than was previously available with the prior art catalysts, such as Koch, that operated at $30,000 \text{ h}^{-1}$ or less. Neither Smojver nor Koch alone or in combination teaches "a catalyst comprising a mixed oxide of zirconium and of cerium in the form of a solid solution" or "a HSV of more than $50,000 \text{ h}^{-1}$." "To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." M.P.E.P. Absent any teaching of

these limitations in the cited references, the invention of claim 6 is not obvious. Accordingly, the rejection of claim 6 under 35 U.S.C. § 103 as being obvious over Smojver in view of Koch must be withdrawn.

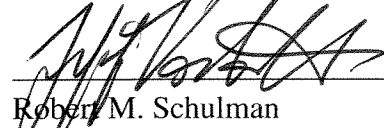
Furthermore, there is no motivation for combining the teachings of Smojver and Koch. "Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art." M.P.E.P. § 2143.01; see also In re Lee, 277 F.3d 1338, 1342-44, 61 USPQ2d 1430, 1433-34 (Fed. Cir. 2002). "The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure." M.P.E.P. § 2143 (citing In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)). Smojver discloses a process of oxidation of ammonia in the presence of an oxidation catalyst comprising alumina, zirconium salt (preferably zirconium oxide) and cerium salt (preferably cerium nitrate). Koch discloses a zirconium oxide bed for treating a stream to reduce N₂O after oxidizing ammonia. A person of ordinary skill in the art would not have been motivated to combine the oxidation catalyst of Smojver with the zirconium oxide bed of Koch since both have completely different purposes.

Accordingly, the rejection of claim 6 under 35 U.S.C. § 103 as being obvious over Smojver in view of Koch must be withdrawn.

Applicant submits that this response addresses all of the issues raised in the Office Action and places the pending claims in condition for allowance. Should any issues remain to be discussed in this application, the undersigned may be reached by telephone. In the event any variance exists between the amount authorized to be charged to the Deposit Account and the Patent Office charges for reconsideration of this application, please charge or credit any difference to the undersigned's Deposit Account No. 50-0206.

Respectfully submitted,
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